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ABSTRACT

The report summarizes pupil behavioral change data from 176 instructional projects involving handicapped children in New York state. Data are presented for reading achievement, mathematics achievement, and a broad category that encompassed language arts, corrective speech, psychomotor, auditory and visual perceptions, personal hygiene, societal and survival as well as occupational outcomes. Criterion referenced test data are provided in six appendixes for trainable mentally retarded, emotionally disturbed, educable mentally retarded, severely speech impaired, physically handicapped, and multiply handicapped. Five noninstructional projects are also reviewed. (CL)

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# NEW YORK STATE EDUCATION FOR THE HANDICAPPED ACT

Title VI-B
Evaluation Report
1976-77

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of School and Categorical Programs Evaluation
Albany, New York 12234

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## FOREWORD

The 1976-77 Annual EHA, Title VI-B Report provides a report of handicapped pupils' achievement while participating in projects sponsored in New York State public institutions. The report follows the guidelines set forth by the U.S. Office of Education for compensatory education. [1/] Additionally, the evaluation reports submitted by one large and one other local education agency may be found in the appendices.

The report, a result of staff contributions by Sherri Gillespie, Robert Miller, Teresa Parisi, Janice Pecora and Lawrence Wiemann, was written by George A. Cronk, Jr. The document was prepared in the Office of Elementary, Secondary and Continuing Education, Research and Planning for the Office for the Education of Children with Handicapping Conditions.

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1/ "ESEA, Title I Program Information #341 DCE/PSB" in accordance with PL 89-10 as amended by PL 93-380, Part D. General Provisions, Section 142 (a) (3).

## OVERVIEW

The State of New York was granted $15,262,560 to serve handicapped children in local education agencies as specified by the Education of the Handicapped Act Title VI-B Part B for fiscal year 1976-77. An additional $1,917,114 was carried forward from the previous fiscal year. A total of $17,179,674 was available for expenditure by local education agencies. All of the prior fiscal year funds plus $7,745,267 of the fiscal 1976-77 funds were budgeted for expenditure. Thus the budgeted total was $9,662,381 for the 1976-77 fiscal year. 1/

There were 10,522 participants receiving some service from the overall program. Sepcifically, there were 1,558 trainable mentally retarded, 1,679 educable mentally retarded, 2,514 emotionally disturbed, 1,457 other health impaired, 722 orthopedically impaired, 509 visually handicapped, 57 near-blind, 651 deaf, 360 hard of hearing and 925 speech impaired participants. 2/

The $9.7 million purchased the services of 687 teachers, 690 teacher aides, and 540 other (psychologists, therapists, administrators, secretaries, etc.) support service personnel. However, from a duplicated point of view a total of 83,337 personnel were trained.

Among the 267 funded projects, 185 projects provided direct instruction for pupils. The 82 projects devoted to support service included $1,005,282 for Child Find projects, $782,845 for Special Education Instructional Materials Centers (repositories), $539,802 for Technical Assistance (personnel training) projects, $92,694 for Arts Festival projects, $51,610 for the development of Individual Educational Plans, and $29,514 for library projects for a total of $2,511,747 budgeted for noninstructional activities.

Local education agencies submitted final evaluation reports in a structured form that described pupil behavioral change. A copy of the document may be found in Appendix I. Those local education agencies hosting Special Education Instructional Materials Centers, Child Find projects and adult training projects, library projects and Individual Education Planning projects may be found in Appendix G. The nine districts which did not submit the appropriate evaluation reports as of March 1, 1978 are cited in Appendix H.

The data in this report were confined to 176 projects of an instructional nature. The data were divided into two specific categories (reading achievement and mathematics achievement) and a broad category that encompassed language arts, corrective speech, psychomotor, auditory and visual perceptions, personal hygiene, societal and survival as well as occupational outcomes. Where sufficient data were available, these data were separated according to the pupil handicapping condition and may be found in Appendices A through F.

1/ Financial Status Report O.E. Form 9039-11 submitted on December 23, 1977.
2/ Performance Report, O.E. Form 9039-2 submitted on December 23, 1978

## EXECUTIVE SUMMARY

The Education for the Handicapped Act (EHA) Title VI-B in New York State provided instruction in conventional academic areas such as reading and mathematics as well as in such areas as auditory and visual perception, personal hygiene (health care), societal and survival skills (safety), corrective speech, psychomotor and occupational skills. Where norm referenced instrumentation was appropriate, achievement in reading increased no less than the equivalent of 4 percentile ranks and as much as the equivalent of 31 percentile ranks. In mathematics, the increases ranged from the equivalent of 2 percentile ranks up to the equivalent of 11 percentile ranks. Usually criterion referenced instruments were employed with mastery rates in reading by objective area ranging from a low of 18 percent of comprehension subskills up to 100 percent in vocabulary subskills.

Emotionally disturbed pupils were more likely to receive academic instruction and achieve conventional increments of growth while the mentally retarded subpopulations (trainable, educable, multiple handicapped) demonstrated improvement in muscle control areas (psychomotor), personal hygiene and health care, survival skills or language development. Not surprisingly, trainable mentally retarded pupils mastered developmental skills at percentages ranging from 27 to 63, whereas multiply handicapped pupils objective mastery percentages ranged from 59 to 82.

Handicapped pupils in local education agencies did learn academic skills, although such skills are usually associated with development at younger age levels for non-handicapped youngsters. Considerable development in the areas of body care and survival skills (usually accomplished by five- through eight-year -old nonhandicapped pupils) was also demonstrated. Many specialized treatments (speech production, auditory recognition, eye movement, limb elevation or retraction) were funded and brought about the desired behavioral changes.

## READING ACHIEVEMENT

Reading Achievement data were aggregated from test administrations for those pupils who had a pretest score and posttest score. With the possible exception of some emotionally disturbed pupils, nearly all handicapped pupils were tested with instruments that were published for younger normal pupils who would perform at a lower grade level. That is, an educable mentally retarded pupil of age 10 (normal grade placement of 5) might have taken a test designed for pupils of age 6 (normal grade placement of 1). If the project sponsor felt that a particular participant's performance could be reliably reflected on a norm referenced test, a norm referenced test was administered. The larger number of pupils were administered criterion referenced tests for only those few specific skills being considered as objectives during the project.

The norm referenced achievement data in Table 1 are averages computed in normal curve equivalent units. While scores across several levels of devices were combined, the relative position of each handicapped population as a group may be inferred from the numbers in parentheses. The educable mentally retarded pupils advanced from a percentile rank of eight as an equivalent to the normal curve equivalent to a percentile rank of 14. The equivalent expectation of a posttest achievement without EHA Title I VI-B intervention would be to the eighth percentile rank.

Table 1
Reading Achievement by Handicapping Condition

| Handicap | Number Tested | Pretest Average Position or Rate | Posttest Average Position or Rate | Average Change |
|---|---|---|---|---|
| Educable Mentally Retarded | 98 | 21 NCE[1](8)[2] | 27 NCE (14) | +6 NCE (6) |
| Visually Impaired-Blind | 12 | 34 NCE (22) | 52 NCE (53) | 18 NCE (31) |
| Visually Impaired-Partially Sighted | 21 | 42 NCE (42) | 50 NCE (51) | 8 NCE (9) |
| Hearing Impaired | 11 | 30 NCE (18) | 34 NCE (22) | 4 NCE (4) |
| Physically Handicapped | 95 | 24 NCE (11) | 31 NCE (18) | 7 NCE (7) |
| Severely Speech Handicapped | 20 | 28 NCE (14) | 30 NCE (18) | 2 NCE (4) |
| Emotionally Disturbed | 202 | 35 NCE (24) | 38 NCE (29) | 3 NCE (5) |
| Multiply Handicapped | 34 | 18 NCE (6) | 27 NCE (14) | 9 NCE (8) |

[1]NCE = Normal Curve Equivalent Unit

[2]Number in parenthesis is a percentile rank equivalent to the normal curve equivalent unit

In general, the larger groups of participants' norm referenced test scores may be more reliable since individual errors of measurement tend to cancel each other out. The emotionally disturbed participants improved their percentile rank position by 5; the educable mentally retarded by 6; and the physically handicapped by 7. This magnitude of improvement was comparable to improvements in other compensatory education projects (educationally deprived) where physical or psychogenic impairments have not been identified.

Usually, the reading performance level of the handicapped pupil was so far below the age/grade norm devised for many norm referenced tests, that raw scores would be difficult to interpret. Testing requires that measurement be accomplished at a pupil's behavioral level both to insure reliability and avoid learner frustration. Sponsors of projects for handicapped pupils selected criterion referenced tests which permitted interpretation of skill mastery rather than a pupil's comparative position to the norming group. The data in Table 2 display the number of pupils attempting and mastering selected reading skills as measured by criterion referenced tests. The phonics objectives were specific and usually appropriate for normal youngsters who would be attending grades two and three.

Table 2

Criterion Referenced Reading Achievement
Across Handicaps

| Reading Skills | Number Failed Pretest | Number Passed Posttest | Percent Passed Posttest |
|---|---|---|---|
| Letter Recognition | 52 | 46 | 88.5 |
| Initial Consonants | 38 | 34 | 89.5 |
| Final Consonants and Blends | 25 | 18 | 82 |
| Vowels: Single Letters | 72 | 52 | 72.2 |
| Vowels: More Than One Letter | 64 | 54 | 84.4 |
| Consonant Digraphs | 26 | 20 | 76.9 |
| Silent Consonants, Hard and Soft C & G | 14 | 12 | 85.7 |
| Rhyming Words | 12 | 9 | 75 |
| Compound Words | 25 | 19 | 76 |
| Contractions | 54 | 48 | 88.9 |
| Endings | 28 | 23 | 82.1 |
| Prefixes, Suffixes, Affixes | 84 | 68 | 80.9 |
| Syllables | 66 | 54 | 81.8 |
| Sentence Structure | 27 | 19 | 70.4 |
| Punctuation | 19 | 10 | 52.6 |
| Antonyms | 29 | 24 | 82.8 |
| Homonyms | 16 | 15 | 93.7 |
| Synonyms | 21 | 21 | 100 |
| Word Meaning | 42 | 22 | 52.4 |
| Fantasy and Reality | 17 | 3 | 17.6 |
| Inferences, Cause or Effect | 70 | 51 | 72.9 |
| Facts and Details | 127 | 110 | 86.6 |
| Following Directions | 55 | 52 | 94.6 |
| Main Ideas | 91 | 73 | 80.2 |
| Drawing Conclusions | 69 | 59 | 85.5 |
| Sequence | 46 | 36 | 78.3 |
| Comparisons, Analogies, Similes, Metaphors, etc. | 13 | 8 | 61.5 |

The comprehension objectives (facts, details, inferences, main ideas, drawing conclusions) were leveled at grades three to six and the sub-population addressing such objectives was the emotionally disturbed group. The data in the percent passed posttest column was computed by dividing the number who had passed the posttest by those pupils who had failed the pretest and multiplying that ratio by 100. The number who passed the posttest was a subset of those who failed the pretest.

An aggregated sum across several levels of skills indicated in most cases that between 70 and 90 percent of the participants could be expected to achieve selected objectives across the treatment period. Although the objectives that handicapped pupils attempted were usually achieved by younger (nonhandicapped) pupils, the handicapped pupils did in fact demonstrate that they could master the same objectives and learn to read to various degrees of competence.

## MATHEMATICS ACHIEVEMENT

Due to the varying disabilities, different target groups have been assessed with different measurement devices. Where appropriate, project administrators preferred to have norm referenced tests administered. Often criterion referenced tests fitted the local institutions mathematics objectives and handicapped pupils characteristics better. Data from the two sources were not always comparable. Norm referenced data usually were reported with reference to normal curve equivalents, grade equivalents, or percentile ranks. Criterion referenced test data were reported in reference to skill mastery.

The skill mastery approach is particularly attractive to assess behavioral change when a target population is at a great distance from a typical norming population. Groups of trainable mentally retarded pupils and multiply handicapped pupils were concentrating on individual criterion referenced skills of a pre-operational nature. Such skills deal with equivalence, order, fewer, more and number. Among 44 trainable mentally retarded pupils who had failed such concepts on the pretest, 14 (32 percent) had mastered them after treatment. Similarly, from among 22 multiply handicapped pupils attempting similar objectives after having failed criterion referenced test items previously, 13 (59 percent) demonstrated skill mastery.

Some local education agencies elected to assess pupils mathematics progress with reference to a population working at a similar difficulty level. At the outset of the supplementary activities, the target group's reference would be to the lowest quarter in a distribution on a particular norm referenced test. The goal of the compensatory treatment would be to advance the participants' relative position in the distribution at the time of the next test administration. Scores were reported in grade equivalents and normal curve equivalents for educable mentally retarded, physically handicapped, emotionally disturbed, and multiply handicapped pupils. The normal curve equivalent scores are followed in parentheses by percentile rank equivalent for interpretation. The data have been aggregated across the grades to simplify the display in Table 3. The numbers tested refer to different groups.

The data reported in grade equivalent units were reduced to the rate of growth per month between tests. The normal pupil's rate of growth was considered to be one month for each month of the 10-month school year. A pretreatment estimate of growth was accomplished by dividing the participants accumulative school years (in months) into the adjusted pretest score. Without intervention by the EHA, Title VI-B projects, there was no reason to believe that the growth rate would be accelerated.

Educable mentally retarded pupils who previously demonstrated less than one half month achievement for each month of school time with reference to the norm demonstrated that the monthly growth rate could be tripled during compensatory activities. This finding was consistent with the normal curve equivalent data, where similar participants improved their percentile rank standing on the average by two (2) units. Typically, such participants would have fallen further and further behind the norm group without such intervention.

Table 3
Mathematics Achievement By Handicapping Condition

| Handicap | Number Tested | Pretest Average Position Or Rate | Posttest Average Position Or Rate | Average Change |
|---|---|---|---|---|
| Educable Mentally Retarded | 39 | 21 NCE[1] (8)[2] | 23 (10) NCE | +2 NCE (2) |
| | 43 | .4mo./mo. GE [3] | 1.2mo/mo. GE | +.8mo./mo. GE |
| Physically Handicapped | 41 | 25 NCE (11) | 27 NCE (14) | +2 NCE (2) |
| | 11 | .7 mo./mo. GE | .4 mo./mo. GE | -.3mo./mo. GE |
| Emotionally Disturbed | 148 | 34 NCE (22) | 38 NCE (28) | +4 NCE (6) |
| | 15 | .9 mo./mo. GE | 1.4mo./mo. GE | +.5 mo./mo. GE |
| Multiply Handicapped | 20 | 22 NCE (9) | 32 NCE (20) | +10 (11) |
| | 18 | .3 mo./mo. GE | .9 mo./mo. GE | +.5 mo./mo. GE |

1/NCE = Normal Curve Equivalent Unit
2/Number in parenthesis is a percentile rank equivalent to the normal curve equivalent unit
3/GE = Grade Equivalent Unit

Among the physically handicapped participants, the eleven for whom grade equivalent data were reported failed to improve their rate of growth. Another group of 41, however, advanced an average of two (2) percentile ranks.

The emotionally disturbed target group did not appear to be as academically disadvantaged as other groups participating in EHA, VI-B projects. The pretest status placed such participants near the top of the bottom quarter of the norming population's performance. During the supplementary treatments these pupils either advanced six (6) percentile ranks on the average or demonstrated a growth rate improvement of one half month above that with which they had entered the treatment.

Compensatory mathematics treatments did not receive a strong priority ranking among project designers. Local education agencies that did make supplementary mathematics instruction a part of the projects demonstrated that progress could be obtained across populations as different as trainable and educable mentally retarded, physically handicapped, multiply handicapped and emotionally disturbed.

## OUTCOMES IN AREAS OTHER THAN READING AND MATHEMATICS

Projects designed for handicapped pupils provided services more basic than those usually associated with compensatory education. The supplementary services provided by EHA Title VI-B often supported objectives in the psychomotor domains as well as in the cognitive domains. The needs of some pupils were so elementary that immense developmental effort was required before many pupils could hope to address the State's priorities of reading and mathematics achievement.

For example, trainable mentally retarded pupils (pupils with intelligence quotients ranging between 20 and 50) received services that supported objectives usually acquired by normal intelligence children prior to entering the formal school program. Personal hygiene and health care, psychomotor, speech therapy, societal and survival, as well as auditory and visual objectives appeared in project applications with increasing frequency.

Personal Hygiene/Health Care objectives deal with such basic bodily functions as eating with implements, drinking, nail care, menstrual hygiene, dressing and so forth.

Psychomotor objectives attempt to bring about standing, sitting, grasping, lifting, transferring, stacking and the like.

Speech Therapy objectives refer to correcting speech, sending or encoding patterns. Such efforts usually require the training of larynx muscles, adjusting pitch, artículation, or the extinction of inappropriate sounds.

Societal/Survival objectives refer to skills acquired for social interaction with others, using public transportation, crossing streets safely, avoiding potentially dangerous situations, etc.

Auditory/Perceptual objectives require reacting to selected sounds, identifying particular sounds, differentiating between sounds, locating sources, and so forth.

Visual/Perceptual objectives require recognition along the lines of shape, size, people, colors, discrimination, matching, establishing eye contact, following moving objects and the like.

Basic cognitive readiness objectives specify the skill attainment associated with up and down, larger versus smaller, left and right, identity, following directions, etc.

Measures of achievement in these areas usually were derived from less thoroughly standardized measures in contrast to conventional commercially prepared reading and mathematics tests. Often scores collected for pupils were obtained from an examiner's observation in the form of ratings. The information in Table 4 is a composite of changed (improved) ratings collected from several different normative measurement devices for pupils. The numbers indicate the number of pupils rated and with the exception of the six groups noted by the superscript the groups improved between the pretreatment observations and posttreatment observations.

The data in Tables 4 and 5 reflect the skill areas pursued during the compensatory treatments. From the norm referenced data, improvement in the societal/survival content area by the multiply handicapped was greatest in terms of the number of pupils. The distribution of pupils by objective skill area observed in the norm referenced data reveals societal/survival skills as the most emphasized area for objectives. Speech therapy objectives assessed by norm referenced tests contained the most numerous failures with reference to improvement, but the 27 pupils identified as failing constituted less than six percent (6%) of those attempting speech therapy objectives. The norm referenced data reveal that among all of the 2,158 skill area participants (a duplicated count), fewer than 2.5 percent did not demonstrate the improvement.

Table 4
Normative Measure Outcomes Other Than Reading and Mathematics

| Handicap/ Skill | Trainable Mentally Retarded | Educable Mentally Retarded | Hearing Impaired | Physically Handicapped | Speech Impaired | Emotionally Disturbed | Multiply Handicapped |
|---|---|---|---|---|---|---|---|
| Language Arts | 38 | 55 | - | 29 | 39[c] | 148 | 48 |
| Occupational | 15 | - | - | - | - | - | - |
| Personal Hygiene/ Health Care | 34 | 39 | - | 29 | - | 31 | - |
| Psychomotor | 49 | 42 | - | 23 | 20 | 50[e] | 61 |
| Speech Therapy | 21 | 82[a] | 81 | 53[b] | 86[d] | 17 | 86[f] |
| Societal/ Survival | 25 | 64 | - | 41 | - | 39 | 579 |
| Auditory Perception | 24 | 44 | - | 16 | 36 | - | 42 |
| Visual Perception | 27 | - | - | 25 | - | 20 | - |

a 2 pupils failed to improve
b 16 pupils failed to improve
c 6 pupils failed to improve
d 5 pupils failed to improve
e 19 pupils failed to improve
f 4 pupils failed to improve

Table 5

Students With Handicapping Conditions Failing Pretest And Passing Posttest On Criterion Referenced Measures In Areas Other Than Reading And Mathematics

| | Trainable Mentally Retarded | | | Educable Mentally Retarded | | | Multiply Handicapped | | | Severely Speech Impaired | | | Deaf | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Failed Pre | Passed Post | % | Failed Pre | Passed Post | % | Failed Pre | Passed Post | % | Failed Pre | Passed Post | % | Failed Pre | Passed Post | % |
| Personal Hygiene/ Health Care | 67 | 18 | 27 | - | - | - | 90 | 70 | 78 | - | - | - | - | - | - |
| Psychomotor | 200 | 125 | 63 | 53 | 44 | 83 | 256 | 176 | 69 | 50 | 34 | 68 | - | - | - |
| Speech Therapy | 119 | 62 | 52 | 12 | 5 | 42 | 130 | 106 | 82 | 70 | 54 | 77 | 13 | 0 | 0 |
| Societal/ Survival | 233 | 81 | 35 | - | - | - | 32 | 26 | 81 | - | - | - | - | - | - |
| Auditory Perception | 147 | 88 | 60 | 48 | 34 | 71 | 109 | 84 | 77 | 15 | 11 | 73 | - | - | - |
| Visual Perception | 246 | 141 | 57 | 47 | 38 | 81 | 225 | 178 | 79 | - | - | - | - | - | - |
| Basic Cognitive Readiness | 44 | 14 | 32 | - | - | - | 22 | 13 | 59 | - | - | - | - | - | - |

Commercially prepared measures of achievement in the psychomotor and other domains are fewer in number than those available for pupils who are only educationally deprived in the cognitive areas. The emphasis of measurement has been to identify deficient skills and construct a test solely around the skill in a criterion referenced mode. Consequently, the larger portion of data reported in Table 5 were derived from assessment conducted with criterion referenced tests. Generally, such tests were designed to measure mastery of a skill. The act of passing a mastery test required pupils to meet all of the conditions described for executing the skill satisfactorily. Data are reported by sponsors with reference to the skill or objective attainment during the compensatory treatment. No normative contrast with reference to peer performance at a particular site is encompassed by such measurement practices. At one site, a particular instructional level objective for a youngster may be shared by one or two or no other youngsters in the class. Consequently, the choice of measures to assess behavioral change often varies as to the learner's capacity. An emotionally disturbed pupil may have a cognitive capacity similar to a norm group. Some project sponsors elected to administer norm referenced tests in such cases. On the other hand, when mulitply handicapped pupils' debilities were sufficiently severe a criterion referenced test was selected.

Five groups of handicapped pupils were found to be attempting objectives that were assessed by criterion referenced measures. The participants cited in Table 5 associated with a particular objective under the failed pretest column were tested before the treatment. During treatment or at the conclusion of the project's life the same pupils who failed the pretest were tested again. The number of pupils that passed the objective were recorded under the Passed Posttest column. The percentage of those passing the objective in comparison to the pupils found in the Failed Pretest column is found in the next column headed by %. The percentages range from zero (no deaf pupils passed speech therapy objectives) to 83 (the educably mentally retarded pupils who attempted psychomotor objectives). The largest populations of handicapped pupils attempting criterion referenced objectives were frequently selected for treatment with a 60 percent or better mastery rate. The same was true for auditory/perception objectives across the trainable and educable mentally retarded, multiply handicapped and severely speech impaired. The target groups ranged from 57 to 81 percent mastery on the visual perception skills. Societal/survival skills were attempted and mastered at a rate of 35 percent by the trainable mentally retarded participants and 81 percent by the multiply handicapped pupils. The profoundness of the handicap on the part of the trainable mentally retarded pupils was revealed when the personal hygiene/health care, societal/survival and basic cognitive readiness areas were reviewed. Mastery was indicated at a rate across treatments at 27, 35, and 44 percent, respectively. The criterion referenced data reveal that severely speech impaired pupils accomplished 70 percent of the behavioral objectives in the areas directly associated with speech impediments (speech therapy, auditory/perception) and nearly as well on psychomotor tasks. While separate analyses by skill areas and handicap are provided in the appendices, the overall findings reveal patterns of substantial achievement where little or no achievement would be expected due to the effects solely of maturation.

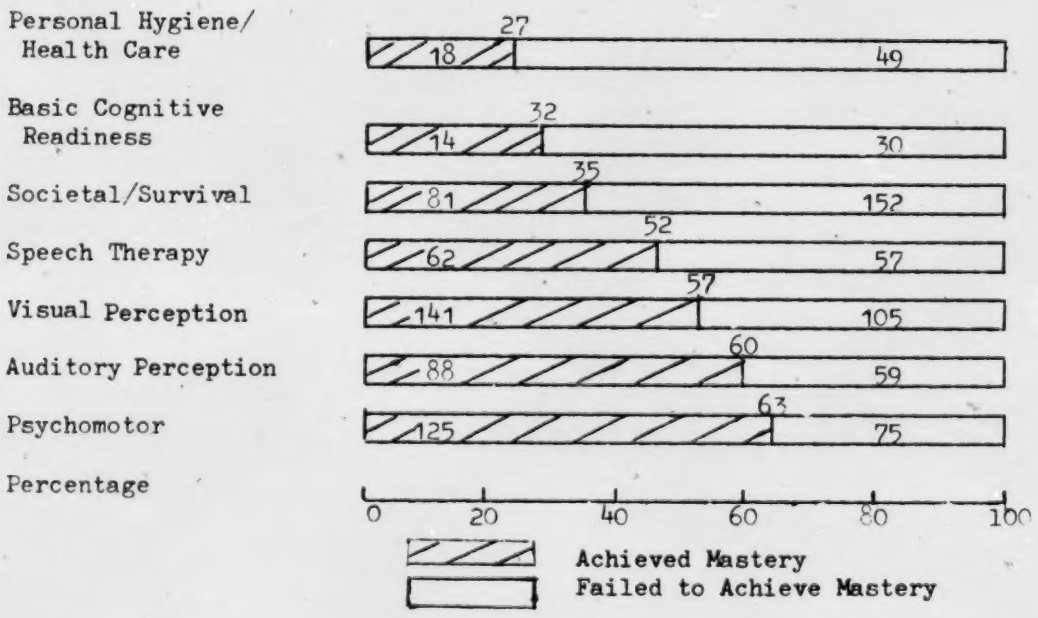
## APPENDIX: A

### Trainable Mentally Retarded

The most frequently selected objectives for trainable mentally retarded (TMR) children were oriented toward bringing about identification or recognition in the visual perception areas. Such skills involve such elementary abilities as eye movement (following, left-to-right) in addition to visual recognition or identification processes. Among 246 pupils attacking such objectives, 141 or 57 percent were successful as recorded by criterion referenced measures. An additional 27 pupils demonstrated improvement measured by norm referenced instruments. The second most popular objectives involved societal and survival skills. Among 233 participants, 81 or 35 percent demonstrated mastery on criterion referenced devices. The data in Illustration 1 reveal that 63 percent of the TMR pupils achieved the psychomotor objectives which involved skills as diverse as correctly extending a limb to sorting or assembling machine parts. Sixty-seven pupils addressed skills in the areas of personal hygiene and health care, and 44 pursued basic cognitive readiness under this funding source. The criterion referenced data indicate that fewer than one-third in either skill area mastered the criteria (tests) required for mastery.

This target population brought tremendous handicaps to the compensatory activities. Yet even with severe deficits, the TMR population demonstrated improvement.

Illustration 1
Trainable Mentally Retarded
Criterion Referenced Mastery Performance



APPENDIX: B

Emotionally Disturbed

An emotionally disturbed pupil was one who exhibited one or more of the following characteristics:

a) Inability to learn which cannot be explained by intellectual, sensory, or health factors

b) Inability to build or maintain satisfactory interpersonal relationships with peers and teachers

c) Persisting depression, unhappiness

d) Inappropriate behavior or emotions under normal circumstances

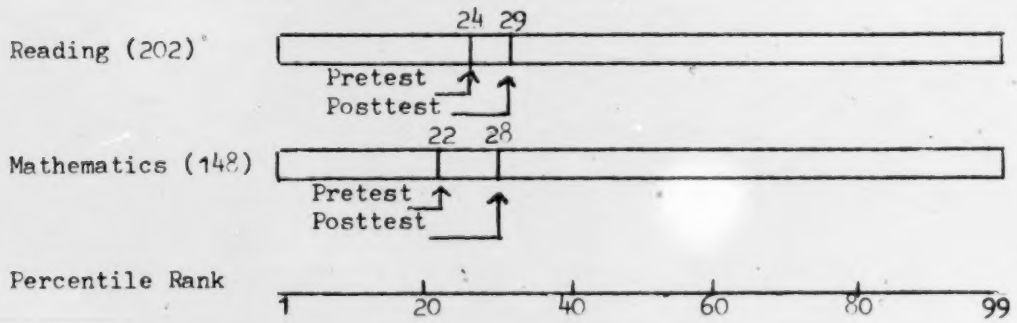
e) Physical symptoms or fears associated with personal or school problems

Autistic and schizophrenic children would be included by this description of the handicapping condition. However, such pupils are not necessarily intellectually deficient. Below grade level performance academic tasks may be associated with limited school attendance (exposure) rather than minimal cognitive capacity. The project activities that were developed for emotionally disturbed pupils centered on reading and mathematics. The norm referenced data indicated that the project participants pretreatment average performance was at the equivalent of the 24th percentile rank in reading and 22nd percentile rank in mathematics.

Illustration 2

Emotionally Disturbed

Norm Referenced Reading and Math Data



By the conclusion of the treatments the reading participants had advanced to the equivalent of the 29th percentile while the mathematics participants had advanced to the equivalent of the 28th percentile as shown in Illustration 2. Such performance places the emotionally disturbed population at a distance of only approximately one-half standard deviation from the mean of the norm.

Criterion referenced reading achievement tests were administered to participants from several projects. (Some criterion referenced tests may be administered in short sections in contrast to norm referenced devices, an advantage when working with pupils with low frustration thresh holds.) The data in Table 6 indicate mastery rates were most often in excess of 70 percent.

Table 6

Emotionally Disturbed
Criterion Referenced Test Reading Data

| Reading Skills | Failed Pretest | Passed Posttest | Percent Passed Posttest |
|---|---|---|---|
| Letter Recognition | 33 | 33 | 100 |
| Initial Consonants | 28 | 27 | 96 |
| Medial Consonants | 9 | 9 | 100 |
| Final Consonants and Blends | 17 | 12 | 71 |
| Consonant Blends | 16 | 16 | 100 |
| Vowels: Single Letters | 67 | 54 | 81 |
| Vowels: More Than One Letter | 64 | 54 | 84 |
| Consonant Digraph | 14 | 14 | 100 |
| Silent Consonants, Hard & Soft C & G | 14 | 12 | 86 |
| Rhyming Words | 11 | 8 | 73 |
| Compound Words | 23 | 17 | 84 |
| Contractions | 49 | 45 | 92 |
| Endings | 22 | 19 | 86 |
| Prefixes, Suffixes, Affixes | 78 | 65 | 83 |
| Syllables | 63 | 52 | 83 |
| Sentence Structure | 27 | 19 | 70 |
| Punctuation | 19 | 10 | 53 |
| Antonyms | 29 | 26 | 90 |
| Homonyms | 16 | 15 | 94 |
| Synonyms | 21 | 21 | 100 |
| Word Meaning | 6 | 3 | 50 |
| Fantasy and Reality | 17 | 3 | 18 |
| Classifying | 3 | 3 | 100 |
| Inferences, Cause or Effect | 76 | 55 | 72 |
| Facts and Details | 120 | 103 | 86 |
| Following Directions | 50 | 48 | 96 |
| Main Ideas | 93 | 76 | 82 |
| Drawing Conclusions | 68 | 58 | 85 |
| Sequence | 41 | 32 | 78 |
| Author's Purpose & Technique | 9 | 4 | 44 |
| Setting & Character Analysis | 2 | 1 | 50 |
| Comparisons, Analogies, Similes, Methaphors, etc. | 5 | 2 | 40 |

The objectives for the emotionally disturbed were at levels much closer to the age/grade norm of pupils without the handicapping conditions than pupils with different handicapping conditions. The largest numbers of participants were working on the comprehension skills of main ideas and details, drawing conclusions and inferences. Such objectives are derived from upper level elementary and junior high school reading skills.

Emotionally disturbed pupils also concentrated on Language Arts (writing, spelling, oral vocabulary) skills. The data in Table 4 presented earlier indicated improvements as measured by norm referenced tests.

As a group, emotionally disturbed participants were attempting and achieving conventional academically oriented objectives. The group did not appear to have as severe academic deficiencies as some other handicapped pupils and emotionally disturbed pupils achieved the reading, mathematics, and language arts objectives consistently.

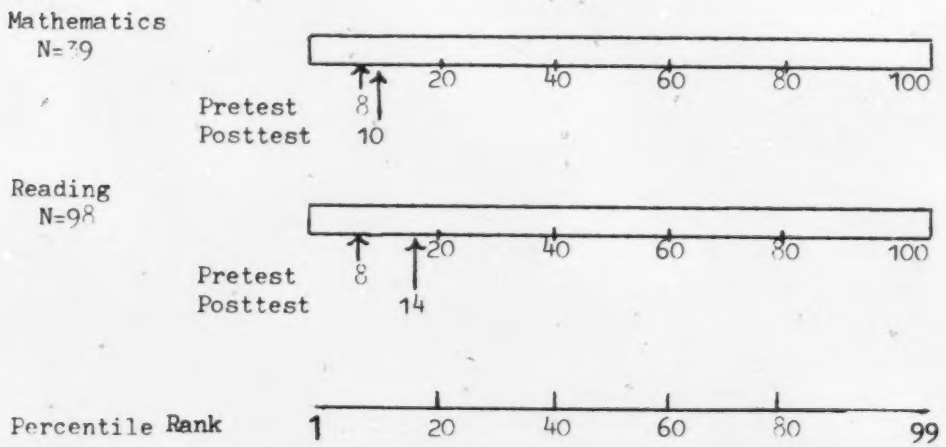
## APPENDIX: C

### Educable Mentally Retarded

Children who were determined to possess general intellectual capacity more than 1.5 standard deviations below the mean of the general population participated in special education programs for the educable mentally retarded. The activities for such children were very often academically oriented and quite similar to activities provided for nonhandicapped children at a younger age.

Where a norm referenced test was felt to be valid some participants were administered a reading or mathematics test. The data in Illustration 3 indicate that such participants started the treatment in the bottom 10 percent in comparison with the norming population. At the conclusion of the treatments in mathematics the group had advanced to above the 10th percentile rank. In reading the pupils had advanced to the 14th percentile rank.

Illustration 3
Educable Mentally Retarded Norm Referenced
Reading and Mathematics Achievement



In both of these subject matter areas, the participants not only held their position, but also improved their performance relative to the norming population.

In the area of reading, some educable mentally retarded pupils were also assessed for growth with criterion referenced devices. The data in Table 7 indicated that for objectives that require mastery performance educable mentally retarded pupils usually could be expected to achieve between 50 to 70 percent of them.

Table 7

Criterion Referenced Reading Achievement
Data for Educable Mentally Retarded

| Reading Skills | Number Failed Pretest | Number Passed Posttest | Percent Passed Posttest |
|---|---|---|---|
| Letter Recognition | 3 | 2 | 67 |
| Initial Consonants | 7 | 5 | 71 |
| Final Consonants and Blends | 7 | 6 | 86 |
| Vowels: Single Letters | 16 | 9 | 56 |
| Consonant Digraphs | 12 | 6 | 50 |
| Compound Words | 2 | 2 | 100 |
| Contractions | 6 | 4 | 67 |
| Endings | 6 | 3 | 50 |
| Prefixes, Suffixes, Affixes | 3 | 2 | 57 |
| Syllables | 5 | 3 | 60 |

This rate of mastery is consistent with under achievers in compensatory education projects without such severe handicaps.

Some participants were assessed for outcomes in areas of other reading or mathematics with norm referenced tests. The data in Table 8 indicate overall advancement (growth) in language arts, personal hygiene, psychomotor skills, speech, survival and auditory perception.

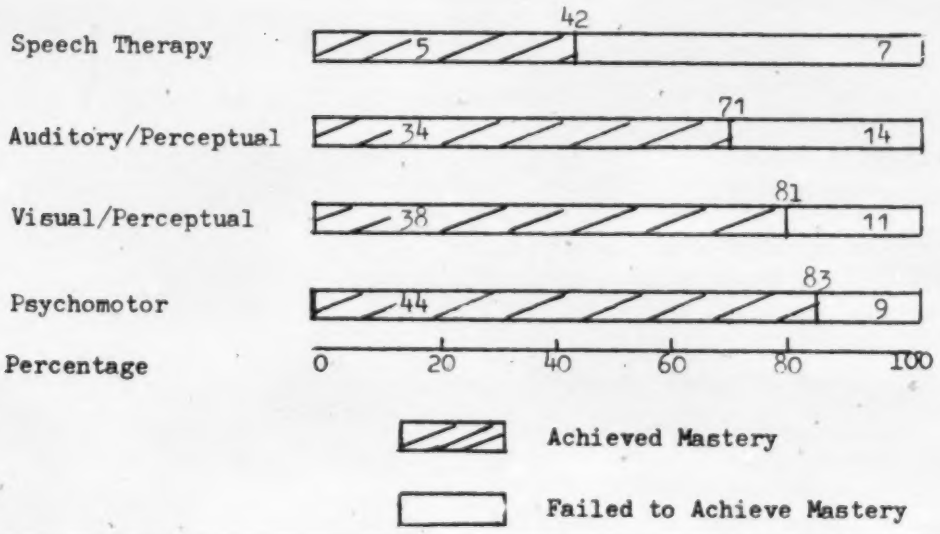
Table 8

Norm Referenced Outcomes Other Than
Reading and Mathematics For Educable Mentally Retarded

| Subject matter area | Pupils | Subject matter areas | Pupils |
|---|---|---|---|
| Language Arts | 55 | Speech Therapy | 82 1/ |
| Personal Hygiene/ Health Care | 39 | Societal Survival | 64 |
| Psychomotor | 42 | Auditory Perception | 44 |

When other participants were assessed for growth by means of criterion referenced tests, substantial progress was also revealed. The shaded area in Illustration 4 displays the portion of the group demonstrating mastery of specific objectives while the unshaded area identifies that percentage failing to demonstrate mastery of selected objectives.

Illustration 4
Educable Mentally Retarded
Criterion Referenced Mastery Performance




1/ Two pupils failed to improve.

The criterion referenced objectives were oriented toward decoding information (visually, auditorily) and encoding (speech production). Additionally motor response production (psychomotor) objectives were pursued.

Educable mentally retarded pupils did learn academic skills albeit at a lower level than would be associated with the age of the participants. The same reading skills that younger nonhandicapped youngsters master were mastered in this program by the participants. Educable mentally retarded pupils devoted considerable time to body care and survival skills usually accomplished by five- through eight-year-old nonhandicapped pupils. Extra effort was also expended in assisting such pupils to receive and decipher stimuli (visual, sound) and produce appropriate responses (language and other muscle motor areas).

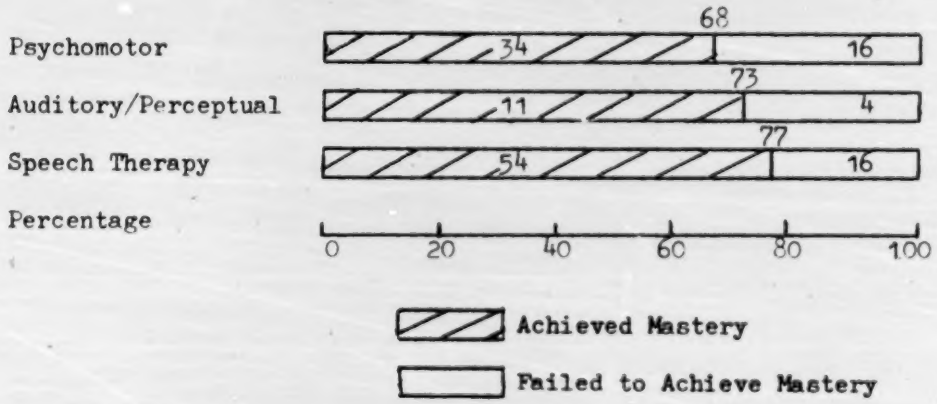
## APPENDIX: D

### Severely Speech Impaired

Pupils who did not communicate verbally or who uttered unintelligible speech were provided with daily instruction by a certified teacher with a specialty in speech and hearing handicaps. This handicap category did not include children who were not speaking because they were not in touch with reality (autism). Rather, the largest group of aphasic children tended to be unable to express themselves for reasons more likely related to motor difficulities. Among the symptoms for which objectives are directed were incoherent patterns, jargon, distorted sounds, ecolalia (meaningless repetition), syllable transposition or no sound production whatever.

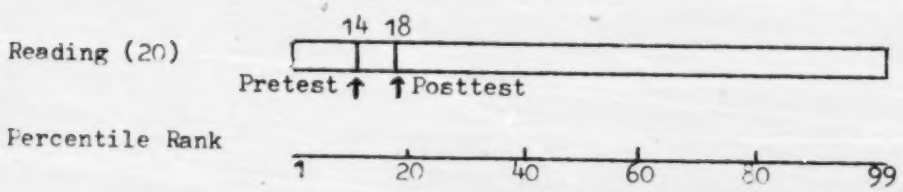
The data in Illustration 5 indicate that among the objectives tailored to the particular speech disorders, the target population achieved 68 percent or better of such objectives. The objectives were confined to psychomotor skills, auditory (input) perceptual skills, and speech therapy (output production) in contrast to other handicapped populations which addressed a wide range of other skill areas.

Illustration 5
Severely Speech Impaired
Criterion Referenced Measurement Performance
Other Than Reading



A few participants (20) were administered a norm referenced test in connection with improving their reading skills. The percentile rank of the average pretest and posttest score advanced by 4 across the treatment period as revealed in Illustration 6.

Illustration 6
**Severely Speech**
Norm Referenced Reading Achievement Data




Expressive aphasic children can master sound production and eventually learn to read assuming that receptive (understanding) or conceptual dificiencies are not also present. The findings, while based upon a very limited sample, were encouraging.

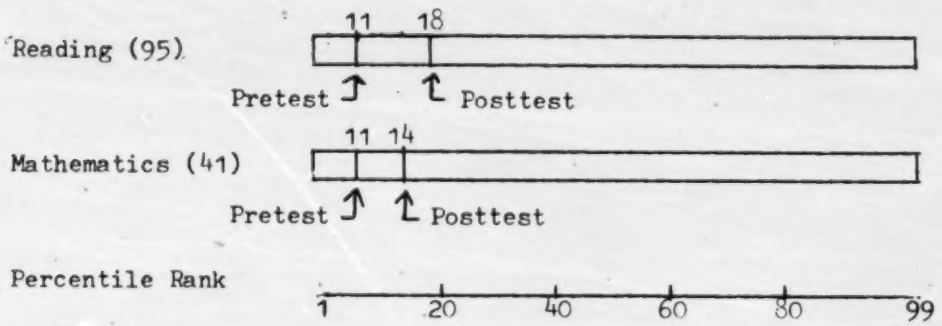
## APPENDIX: E

### Physically Handicapped

Pupils with a severe orthopedic impairment that may affect a child's educational performance are classified as physically handicapped. Additionally, pupils with neurological impairment, limited strength, chronic or acute health problems, heart conditions, nephritis, asthma, sickle cell anemia, hemophilia, lead poisoning or cancer are considered physically handicapped. Such pupils were most often receiving speech therapy, reading or mathematics activities.

The data in Illustration 7 indicate that physically handicapped pupils started reading and mathematics compensatory instruction at the bottom of the second decile as measured by norm referenced tests.

Illustration 7
Physically Handicapped
Criterion Referenced Performance
**Reading and Mathematics Data**




The average physically handicapped pupils in a reading treatment advanced from an equivalent percentile rank of 11 to a percentile rank of 18. In mathematics, the participants advanced from the equivalent of the 11th percentile rank to the 14th percentile rank. A review of the data in Table 5 indicated that 70 percent of the participants receiving speech therapy advanced in speech production.

## APPENDIX: F

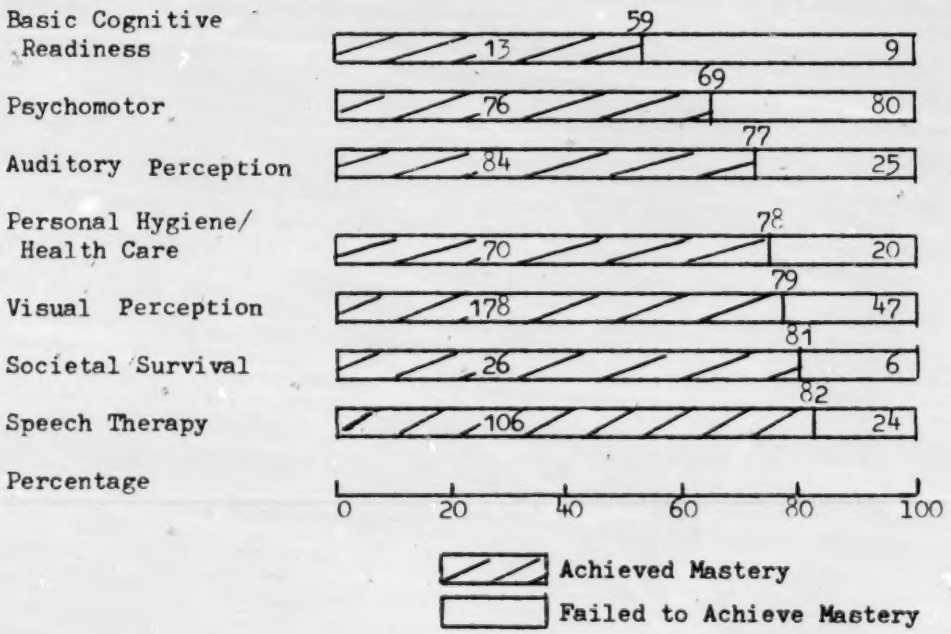
### Multiply Handicapped

Multiply handicapped pupils suffered concomitant impairments such as blindness and mental retardation or orthopedic impairment and mental retardation. Usually the impairments were such that they could not be accomodated in special education treatments solely for one of the impairments.

Understandably, the combination of impairments differed among participants to such a degree that some participants were attempting life support skills while others were able to attempt reading and mathematics objectives normally associated with the early elementary grades.

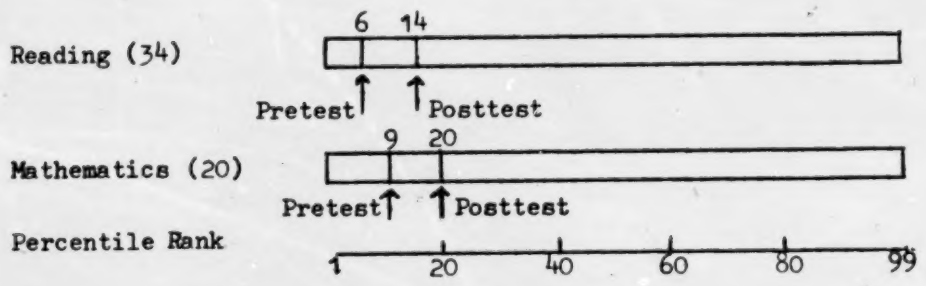
The data in Illustration 8 reveal that the largest numbers of participants were attempting objectives in the area of visual perception. Roughly 80 percent of those pupils attempting such objectives were successful in mastering them. About 70 percent of the speech therapy objectives were mastered. Approximately 80 percent of those participants attempting perconal hygiene/health care and societal/survival skills were successful.

Illustration 8
Multiply Handicapped
Criterion Referenced Performance



When sponsors felt a norm referenced device was appropriate, the average reading achievement growth was equivalent to advancing from the sixth (6th) percentile rank to the fourteenth (14th) percentile rank. The data in Illustration 9 indicate that movement in mathematics pupils who placed at the equivalent of the ninth (9th) percentile on the pretest advanced to the equivalent of the 20th percentile rank at the conclusion of the treatment.

Illustration 9
Mutliply Handicapped
Reading And Mathematics Norm Referenced Data




Criterion referenced tests were often used for assessing multiply handicapped pupils' reading or mathematics progress. Elementary skills were noted as the most frequently selected behavioral areas. The data in Table 9 reveal that among the mathematics treatment participants, forty to sixty percent of the particiants could be expected to demonstrate mastery of objectives dealing with the number line, simple addition, telling time, and common household measurement activities.

Table 9

Multiply Handicapped
Reading and Mathematics Criterion Referenced Test Data

| | Failed Pretest | Passed Posttest | Percent Passed Posttest |
|---|---|---|---|
| Mathematics | | | |
| Preoperational Concepts (equivalence, order number, whole numbers) | 22 | 13 | 59 |
| Addition | 4 | 2 | 50 |
| Measurement (English system) | 6 | 3 | 50 |
| Time and Date | 5 | 2 | 40 |
| Sets: Matching Equivalence | 9 | 5 | 56 |
| Reading | | | |
| Letter Recognition | 16 | 11 | 69 |
| Initial Consonants | 3 | 2 | 67 |
| Word Meaning | 14 | 13 | 93 |
| Facts and Details | 7 | 7 | 100 |
| Following Directions | 5 | 4 | 80 |
| Picture Clues | 8 | 5 | 62 |
| Sequence | 6 | 4 | 67 |
| Comparisons, Analogies, Similes | 8 | 6 | 75 |

Among the reading skills, correct alphabet letter recognition and word recognition were most often attempted. While the levels of the reading skills were between grades one and three, over sixty percent of multiply handicapped pupils attempting such objectives were able to demonstrate mastery.

Treatment of multiply handicapped pupils tended to concentrate on visual/perceptual, psychomotor, speech therapy and auditory/perceptual objectives. The behaviors, where mastery was most frequent, dealt with receiving stimuli (visual, auditory) and responding correctly throught the appropriate motor modes. On a smaller scale, more advanced participants demonstrated the ability to learn reading and mathematical concepts.

APPENDIX G
Noninstructional Projects

1976-77 EHA, Title VI-B
SEMIC

| Project Number | School District/Agency | Allocation |
|---|---|---|
| 77-042C | NYC Board of Education | $200,804 |
| 159C | Southern Westchester BOCES | 21,332 |
| 185C | Syracuse City School District | 13,500 |
| 250C | Broome-Delaware-Tioga BOCES | 9,500 |
| 253C | Tompkins-Seneca-Tioga BOCES | 8,032 |
| 254C | Oswego BOCES | 11,109 |
| 559C | Rochester City School District | 10,575 |
| 587C | St. Lawrence-Lewis BOCES | 6,000 |
| 590C | Oneida-Herkimer-Madison BOCES | 8,000 |
| 595C | Washington-Warren-Hamilton-Essex BOCES | 8,500 |
| 597C | Nassau BOCES | 9,850 |
| 599C | Herkimer-Fulton-Hamilton-Otsego BOCES | 9,000 |
| 601C | Albany-Schoharie-Schenectady BOCES | 13,000 |
| 606C | Hunter College (CUNY Research Found.) | 23,998 |
| 607C | Suffolk BOCES II | 13,500 |
| 625C | Ulster BOCES | 9,500 |
| 703C | Delaware-Chenango-Madison-Ostego BOCES | 9,300 |
| 704C | Clinton-Essex-Warren-Washington BOCES | 9,500 |
| 716C | Rockland BOCES | 28,500 |
| 752C | Dutchess BOCES | 9,506 |
| 793C | Madison-Oneida BOCES | 9,000 |
| 803C | Steuben-Alleghany BOCES | 9,600 |
| 811C | Rensselaer-Columbia BOCES | 9,310 |
| 817C | Monroe BOCES #1 | 8,000 |
| 818C | Orleans-Niagara BOCES | 9,900 |
| 819C | Cattaraugus-Erie-Wyoming BOCES | 9,500 |
| 820C | Schuyler-Chemung-Tioga BOCES | 8,935 |
| 821C | Genesse-Wyoming BOCES | 8,500 |
| 832C | Chautaugua BOCES | 9,498 |
| 833C | Monroe-Orleans BOCES II | 8,000 |
| 835C | Onondaga-Madison BOCES | 13,019 |
| 839C | Putnam/Northern Westchester BOCES | 9,000 |
| 841C | Yonkers Board of Education | 13,500 |
| 844AC | Jefferson-Lewis-Hamilton-Herkimer Oneida BOCES | 9,000 |
| 866C | Greene II-Delaware-Schoharie-Otsego BOCES | 9,507 |
| 871C | Saratoga-Warren BOCES | 6,000 |
| 879C | Cortland-Madison BOCES | 8,975 |
| 886C | Cayuga-Onondaga BOCES | 8,000 |
| 922C | Hamilton-Fulton-Montgomery BOCES | 9,185 |

| Project Number | School District/Agency | Allocation |
|---|---|---|
| 77-925C | Livingston-Steuben-Wyoming BOCES | $ 6,000 |
| 926C | Sullivan BOCES | 11,130 |
| 942C | Buffalo City School District | 13,000 |
| 950C | Erie II-Cattaraugus BOCES | 7,879 |
| 956C | Orange-Ulster BOCES | 6,000 |
| 1166C | Broome-Delaware-Tioga BOCES | 35,318 |
| 1194C | NYC Board of Education | 53,583 |
| 1223 | Franklin-Essex-Hamilton BOCES | 13,500 |
| 1225 | Wayne-Finger Lakes BOCES | 13,500 |
| 1228 | Alleghany BOCES | 13,500 |
| | TOTAL | $782,845 |

1976-77 EHA, Title VI-B
Child Find

| Project Number | Agency | Allocation |
|---|---|---|
| 77-958C | Cambridge Central School District | $ 9,324 |
| 1036 | Freeport UFSD | 45,233 |
| 1053 | Steuben-Alleghany BOCES | 32,939 |
| 1079 | Rochester City School District | 115,563 |
| 1096C | Monroe BOCES #1 | 127,349 |
| 1100C | Monroe-Orleans BOCES #2 | 58,791 |
| 1102 | Cattaraugus-Erie-Wyoming BOCES | 23,460 |
| 1120C | Chautaugua BOCES | 46,290 |
| 1162 | Webster Central School | 27,679 |
| 1170C | Syracuse City School District | 24,837 |
| 1178 | NYC Board of Education | 233,097 |
| 1185C | Nassau BOCES | 117,791 |
| 1191 | Chittenango Central School District | 3,064 |
| 1196 | Hamilton-Essex BOCES | 24,943 |
| 1197 | Erie II-Cattaraugus BOCES | 18,808 |
| 1205 | Tompkins-Seneca-Tioga BOCES | 16,550 |
| 1232 | Nassau BOCES | 19,976 |
| 2001C | Herkimer-Fulton-Hamilton-Otsego BOCES | 35,239 |
| 2015C | Delaware-Chenango-Madison-Otsego BOCES | 24,349 |
| | TOTAL | $1,005,282 |

1976-77 EHA, Title VI-B
Adult Training

| Project Number | District/Agency | Allocation |
|---|---|---|
| 77-591AC | SUC at Buffalo: Research and Development Complex | $ 14,929 |
| 943C | NYC Board of Education | 20,459 |
| 1111C | Albany-Schoharie-Schenectady BOCES | 3,647 |
| 1188C | Orange-Ulster BOCES | 8,244 |
| 1199 | Monroe BOCES #1 | 1,509 |
| 1187 | Albany-Schoharie-Schenectady BOCES | 64,112 |
| 1227C | Onondaga-Madison BOCES | 298,468 |
| 1239C | Rockland BOCES | 128,434 |
| | TOTAL | $539,802 |

1976-77 EHA, Title VI-B
Library

| Project Number | Agency | Allocation |
|---|---|---|
| 77-760 | Nassau BOCES | $39,514 |

Developing Individual Education Plans

| Project Number | Agency | Allocation |
|---|---|---|
| 77-1219 | Monroe-2-Orleans BOCES | $ 9,765 |
| 1220 | Rochester City School District | 13,500 |
| 1221 | Saratoga-Warren BOCES | 18,454 |
| 1222 | St. Lawrence-Lewis BOCES | 9,891 |
| | TOTAL | $51,610 |

APPENDIX: H

EHA, VI-B
Projects for Which Districts Did
Not Provide Evaluation Reports
As of March 1, 1978

| Project Number | School District/Agency | Allocation |
|---|---|---|
| 77-853 | Shoreham-Wading River CSD | $ 8,097 |
| 877 | Schoharie CSD | 8,873 |
| 917 | Sugar Loaf UFSD | 10,252 |
| 1076 | Herkimer CSD | 12,284 |
| 1121C | Saranac CSD | 25,000 |
| 1139 | Albany-Schoharie-Schenectady BOCES | 17,500 |
| 1161 | Bethpage UFSD | 25,233 |
| 1181C | Suffolk BOCES II | 46,250 |
| 1208 | Plattsburgh CSD | 25,000 |
| 1210 | Suffolk BOCES II | 64,970 |
| | TOTAL | $243,459 |